SKIN CANCER IN BLACK AMERICANS: A REVIEW OF 126 CASES

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Primary cancer of the skin is rare in blacks. The records of 126 black patients with skin cancer were reviewed. Histopathologic findings included squamous cell carcinomas (43) basal cell carcinomas (39) malignant melanomas (8) dermatofibrosarcomas (16) Bowen's disease (6) mycosis fungoides (14) and sebaceous cell carcinoma (1).

There is a higher percentage of skin cancer involving covered areas in blacks than among whites. Squamous cell carcinoma was the most common skin cancer in blacks. The distribution of basal cell carcinoma in blacks was 30 percent in this series, as compared with 80 percent in whites in the 1977 to 1978 survey. The majority of patients with squamous cell carcinoma had associated predisposing conditions and lesions on non–sun-exposed skin. Sunlight and occupational chemical exposure did not appear to be associated with skin cancer in blacks in this series.

Cancer of the skin is one of the most common forms of cancer among whites in the United States; however, it is rare among blacks. The present annual incidence of nonmelanoma skin cancer in whites in the United States is approximately 165 per 100,000 people. At least 300,000 new cases of nonmelanoma skin cancer will be diagnosed each year in the United States.[1] The incidence of melanoma in whites, however, was reported to be 8.6 as compared with 0.7 per 100,000 in blacks during the period 1978 to 1981. The annual age-adjusted incidence rate of melanoma in blacks showed an increasing trend during this period (from 0.4 to 1.0 per 100,000 people).[2] The five-year relative survival rate of melanoma in blacks was reported to be 67 percent as compared with 83 percent for whites from 1973 to 1979.[3]

There are a few case reviews on cancer of the skin in blacks.[4-6] Their findings were not similar to those seen in the series reported here. From 1947 to 1985, 126 black patients with skin cancer seen in Howard University Hospital and in private practices of Howard University Hospital faculty were identified and reviewed. The purpose of the study was to investigate whether black patients with skin cancer have unusual patterns of anatomic distribution and histomorphologic cell types. The data obtained from this study could provide valuable information for developing hypotheses for further research on skin cancer in blacks.

MATERIALS AND METHODS

The Tumor Registry of Howard University Cancer Center provided the names, hospital numbers, record abstracts, and pertinent follow-up information on patients with skin cancer. Of 126 cases, 29 patients were seen in the Tumor Clinic and Department of Surgery at Freedmen's Hospital during the period 1947 to 1959. Cases from a previous study of skin cancer in blacks were included.[4] Among the remaining 97 patients, 66 patients were seen in the Howard University Hospital and 31 in the private practice offices of the Howard University dermatology faculty during the period 1960 to 1985. Where possible, abstract

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TABLE 1. HISTOPATHOLOGIC TYPES OF SKIN CANCER IN BLACKS, HOWARD UNIVERSITY HOSPITAL, 1947-1985

Pathologic Types	Cases No. (%)
Squamous cell carcinoma	43 (34.1)
Basal cell carcinoma	38 (30.2)
Malignant melanoma	8 (6.4)
Dermatofibrosarcoma	16 (12.7)
Bowen's disease	6 (4.7)
Mycosis fungoides	14 (11.1)
Sebaceous cell carcinoma	1 (0.8)
Total	126 (100.0)

Figure 1. Basal cell carcinoma of the face in a black patient

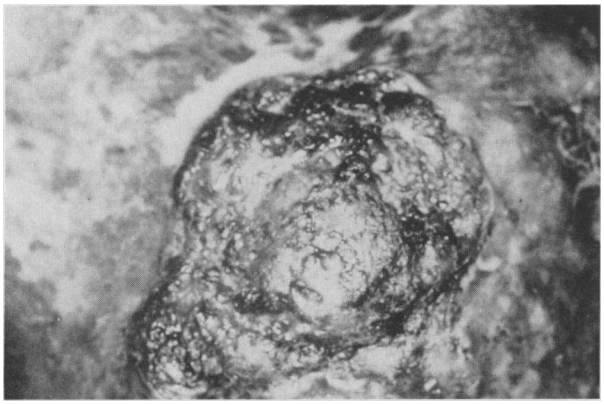

Figure 2. Squamous cell carcinoma of the leg in a black patient

information was supplemented by data from the patients' original hospital records. All cases were histologically confirmed.

RESULTS

There were 68 men (54 percent) and 58 women (46 percent) in the study. The patients' ages ranged from 22 to 86 years (mean age, 57 years). Greater than 90 percent of the patients were between the ages of 40 and 86 years at the time of their diagnosis.

By histologic classification, there were 43 patients (34.1 percent) with squamous cell carcinoma in this series, making it the most common form of skin cancer in black patients (Table 1). A relatively high proportion of basal cell carcinoma (30.2 percent) was seen. There were 8 (6.4 percent) malignant melanomas, 16 (12.7 percent) dermatofibrosarcomas, 6 (4.7 percent) Bowen's disease, 14 (11.1 percent) mycosis fungoides, and 1 sebaceous cell carcinoma (Table 1). The size of the tumors ranged from 0.5 cm to 11 cm.

All of the basal cell carcinomas arose from a solitary focus and were similar histologically (Figure 1). Microscopically, these tumors exhibited characteristic nests or cords of small, dark-staining epithelial cells with palisading of the peripheral cells. There were varying depths of the advancing margins of the neoplasms.

The squamous cell carcinomas were of the frankly invasive variety (Figure 2). There was invasion of the dermis and subcutaneous tissues by irregular and rounded islands of squamous cells, separated by small amounts of stroma. Of these squamous cell carcinomas seen from 1960 to 1985, approximately 33 percent were invasive.

By anatomic location, skin cancer occurred on the face, head, and neck in 34 percent of patients, on the trunk in 4.1 percent, on the upper extremities in 12.4 percent, on the lower extremities in 21.7 percent, and on other sites including the anus and unclassified areas in 27.8 percent (Table 2). The greatest distribution of the tumors in men occurred on the face, head, and neck, while in women, they were found on the lower extremities. Of the basal cell carcinomas, 25 were found on the face, head, and neck, 1 on the buttocks, and 2 on other sites. Of the squamous cell carcinomas, 10 were found on the lower extremities, 6 on the face, head, and neck, and 10 on other sites (Table 3). All

TABLE 2. NUMBER AND PERCENTAGE OF SKIN CANCER BY ANATOMIC SITE AND SEX IN BLACKS, HOWARD UNIVERSITY HOSPITAL, 1960-1985

	Number			Percentage		
	Both Sexes	Male	Female	Both Sexes	Male	Female
Face, Head or Neck	33	20	13	34.0	37.7	29.6
Scalp or forehead	11	8	3			
Eyelid	2	1	1			
Nose	12	7	5			
Cheek, jaw	6	2	4			
Neck	2	2	—			
Trunk	4	2	2	4.1	3.8	4.5
Front	2	1	1			
Back	2	1	1			
Upper Extremities	12	9	3	12.4	17.0	6.8
Arm	9	6	3			
Hand	3	3	—			
Lower Extremities	21	10	11	21.7	18.9	25.0
Leg	14	7	7			
Foot	5	2	3			
Buttocks	2	1	1			
Other Sites	27	12	15	27.8	22.6	34.1
Anus	6	2	4			
Skin, NOS*	21	10	11			
Total for all anatomic sites	97	53	44	100	100	100

*Mycosis fungoides were included

6 cancers of the anus are of the squamous cell type.

DISCUSSION

Cancer of the skin comprised approximately 1.2 percent of malignant tumors in black patients seen at the Howard University Hospital. This is similar to the report of 1.5 percent of malignant skin tumors seen in black patients at the West Tennessee Cancer Clinic, whereas 27 percent of white patients had skin cancer.[5]

The principles of diagnosis and staging of the various kinds of skin cancer have not changed significantly over the past three decades. Therefore, a difference in this observed distribution is not the result of change in diagnostic criteria.

During the past decade the overall incidence of nonmelanoma skin cancer appeared to have increased according to the data from the 1971 to 1972 and 1977 to 1978 nonmelanoma surveys conducted by the National Cancer Institute.[7] The annual age-adjusted incidence rate for blacks was 3.4 per 100,000 population, while the rate among whites was 232.6 in the 1977 to 1978 survey. However, only 68 black patients with nonmelanoma skin cancer were reported in the 1977 to 1978 survey.[8] A predominance of squamous cell carcinoma was seen among blacks, with a higher proportion in women than in men. In the study reported here, squamous cell carcinomas were seen more than basal cell carcinomas, and a higher proportion were seen in men than in women.

The frequency distribution of skin cancer by anatomic site was quite different in white and black patients in the national survey[8] from the series reported here. In the Howard University series, 50 percent of the skin cancers were located on the face, head, and neck. In contrast, 80 percent of the skin cancers in whites occurred on the face, head, and neck.[8] In the Howard University Tumor Registry, blacks had 22 percent of skin cancers on the lower extremities as compared with 2 percent of whites in the 1977 to 1978 national

TABLE 3. ANATOMIC DISTRIBUTION OF BASAL CELL AND SQUAMOUS CELL CARCINOMA IN BLACKS, HOWARD UNIVERSITY HOSPITAL, 1960-1985

	Basal Cell Carcinoma			Squamous Cell Carcinoma			Basal Cell and Squamous Cell Carcinoma No. (%)	National Data* Percentage
	Both Sexes	Male	Female	Both Sexes	Male	Female		
Face, Head, or Neck	25	14	11	6	5	1	31 (50.0)	80.8
Scalp	6	4	2	4	3	1		
Eyelid	1	1	—	—	—	—		
Nose	11	6	5	1	1	—		
Cheek	4	2	2	—	—	—		
Neck	1	1	—	1	1	—		
Other	2	—	2	—	—	—		
Trunk	—	—	—	3	2	1	3 (4.8)	9.0
Front	—	—	—	1	1	—		
Back	—	—	—	2	1	1		
Upper Extremities	—	—	—	5	3	2	5 (8.1)	7.1
Arm	—	—	—	3	1	2		
Hand	—	—	—	2	2			
Lower Extremities	1	—	1	10	4	6	11 (17.7)	2.1
Leg	—	—	—	7	2	5		
Foot	—	—	—	1	1	—		
Buttocks	1	—	1	1	1	—		
Groin	—	—	—	1	—	1		
Other Sites	2	2	—	10	5	5	12 (19.4)	1.0
Anus	—	—	—	6	2	4		
Other	2	2	—	4	3	1		
Total	28	16	12	34	19	15	62 (100.0)	100.0

*Percentage of patients with at least one newly diagnosed basal cell or squamous cell carcinoma of the skin in whites, 1977-1978[1]

survey.[8] In Africa, blacks had a higher incidence of skin cancer on the lower legs and feet; this is thought to be associated with repeated trauma.[9,10]

Histologic types of skin cancer are different in white and black patients. In the Howard University series, the frequency distribution was 30 percent basal cell carcinoma, 34 percent squamous cell carcinoma, and 6.4 percent malignant melanoma. This is in contrast to the usual frequency of skin cancer in white patients, which is approximately 65 percent basal cell carcinoma, 30 percent squamous cell carcinoma, and 5 percent other uncommon tumors including malignant melanoma.[11-13]

Basal cell carcinoma is the most common form of skin cancer, representing at least 75 percent of cases in the southern United States and over 90 percent of cases in the northern United States.[1] Basal cell carcinoma in blacks, generally, is rare, with cases only sporadically reported. A recent report showed that 128 black patients with basal cell carcinoma were seen at Charity Hospital of Louisiana between 1948 and 1979,[6] and one additional case was seen in 1986.[14] A nodular or nodular ulcerative lesion was most frequently seen on the skin of the head and neck and 10 percent of the time on the trunk. It is much less common on the upper extremities and quite uncommon on the lower extremities. Basal cell carcinoma has a predilection for sun-exposed areas, and between 80 percent and 90 percent are found on the head and neck.[6]. Most of the remaining neoplasms are distributed about the anterior and posterior trunk (10 percent) and extremities (7 percent), with less than 1 percent appearing in the genital and perianal regions.[15] Nonetheless, in the Howard University

study, the distribution of basal cell carcinoma by anatomic site is quite different compared with other studies: 89 percent of basal cell carcinomas were found on the face, head, or neck and 9 percent were on other unspecified sites. These findings differed from a study on 128 black patients with basal cell carcinoma that reported that 76 percent of basal cell carcinomas occurred on the face, head, or neck.[6]

Squamous cell carcinomas on lower extremities were more common than on the face, head, and neck. These carcinomas were erythematous lesions with varying degrees of scaling and crusting, causing confusion with psoriasis, eczema, infections, and trauma. Squamous cell cancer tends to be more invasive and accounts for about three fourths of the deaths attributed to nonmelanoma skin cancer.[16]

Squamous cell carcinomas in sun-exposed areas of the body tend to occur on the most highly irradiated portions of skin, such as the top of the nose, forehead, and lower lip, but a relatively large percentage (15 percent) of lesions occurred in the anus in the Howard University study. Furthermore, 23 percent of squamous cell carcinoma in women occurred in the anus in this study. Squamous cell carcinomas of non–sun-exposed skin have a greater biologic potential for malignancy and a higher frequency of metastases. When cutaneous squamous cell carcinoma metastasizes, it usually does so first to local lymph nodes, but hematogenous spread can appear, with lung lesions being a frequent manifestation. However, in this series, no lung metastases occurred. The majority of patients with squamous cell carcinoma had lesions on the non–sun-exposed skin. This is in contrast to white patients who develop the majority of squamous cell carcinomas in skin chronically exposed to sunlight.[17] Thus, chronic exposure to sunlight and actinic keratosis may not be important etiologic factors in the development of squamous cell carcinoma in blacks.

Squamous cell carcinoma of the skin may arise as a complication of tropical ulcers, burns, scars, chronic infection, and wounds.[18,19] In Africa, tropical phagedenic ulcers often arise on the lower legs and feet from repeated trauma, become chronically infected, and thus progress to squamous cell carcinoma.[9,10]

Some drugs may be associated with skin cancer. The use of derivatives, especially psoralen in combination with ultraviolet light for the treatment of psoriasis, has been linked primarily to squamous cell carcinoma at sites not ordinarily exposed to sunlight. A recent study reported that the risk of skin cancer in patients treated with oral methoxsalen phototherapy was 2.6 times higher than expected for a matched control group.[20]

Eight patients in the Howard University series had malignant melanoma. This is different from the frequency distribution of melanoma in white patients,[21,22] but is similar to other reported series of melanoma in black patients.[23-26] Lewis[11] reported 97 cases of malignant melanoma seen in Uganda, with 65 percent of the tumors presented on the plantar part of the foot. Thirteen percent of the native population in that area developed pigmented spots on the plantar part of the foot. These pigmented spots may represent premalignant lesions associated with the frequent malignant melanomas seen in this population.[11,27]

The frequency of mycosis fungoides was relatively high in the Howard University study. Although mycosis fungoides is considered a rare disease, it has been reported worldwide. In the United States it accounts for about 1 percent of all deaths from lymphoma.[28] The cause of mycosis fungoides is unknown. There has been some speculation that the mycosis cells are derived from the Langerhans' cell of the epidermis.[29] There has been much debate as to whether mycosis fungoides is a neoplastic process or an inflammatory disease. A recent study showed that T–cell-derived mycosis cells are transformed into neoplastic cells.[30] Many investigators believe mycosis fungoides to be a neoplastic disease.[31]

There was only one sebaceous cell carcinoma in this series. The patient, a 57-year-old woman, had the lesion on the right upper eyelid. Sebaceous carcinoma is a rare tumor of the eyelid and adnexa accounting for less than 5 percent of malignant tumors in this area.[32] Sebaceous cell carcinoma generally occurs in people over 40 years of age, especially in those between the ages of 60 and 64 years.[33]

Six patients with Bowen's disease were identified in this series. Bowen's disease in black patients had been reported infrequently in the literature. Mora et al[34] published a series of 19 cases collected over 34 years in the Tumor Registry of Charity Hospital. In an extensive study by Graham and Helwig,[35] only four of 155 patients

with Bowen's disease were black. In another series on Bowen's disease, Callen and Heading-ton[36] found no blacks among their 130 patients. Exposure to arsenic has been suggested as a possible causative factor in Bowen's disease.[37] A positive history of arsenic exposure could not be confirmed for any of the patients in the Howard University study. A greater association between Bowen's disease and an internal malignancy was shown when the Bowen's disease occurs on the non–sun-exposed areas of the skin.[38] In the study reported here, however, no patients with Bowen's disease had evidence of internal malignancy.

A possible predisposing factor to skin cancer was exposure to sunlight in one patient. Sunlight is an important factor in the development of skin cancer in patients with no dermal pigmentation. Higgenson and Oettle[24] estimated that there is a thousandfold increased risk of developing skin cancer in albino natives when compared with those with pigmented skin. The pigment of the skin stands as a sentinel, guarding the underlying tissues from the baneful effects of sunlight. Skin cancer is most common in light-skinned persons and in equatorial latitudes; sunlight has been implicated as major causative factor of skin cancer.[6] Occupational sunlight exposure appeared as a risk factor in skin cancer. A recent matched case-control study in the Montreal region concluded that there exists an association between the use of a long-tube sunlamp and the risk of squamous cell carcinoma of the skin.[39] Another case-control study in Western Australia showed that an increased incidence rate of superficial spreading melanoma was associated with low total outdoor exposure in early childhood and frequent participation in bathing and fishing.[40] Exposure to sunlight and other environmental factors were found in a few patients in the Howard University study. This contrasts greatly with skin cancers due mostly to sunlight in white patients.

Trauma and burns may be risk factors of skin cancer.[5,9,10] A recent survey of black Americans indicates a high frequency of skin cancer with burn scars.[5] Case reports conclude that squamous cell cancers may occur excessively in scars of chronic inflammatory skin disease such as leprosy, syphilis, and pemphigus vulgaris.[41] In the Howard University study, trauma and burns were associated findings in 13 cases.

There is some evidence that immunosuppressive states may predispose the skin to cancer. Kinlen et al[42] suggest that squamous cell carcinoma of the skin occurs excessively among other groups of patients treated with immunosuppressive drugs.[42] A risk of premalignant skin lesions, including actinic keratosis and Bowen's disease, has been reported in immunosuppressed patients.[43] Skin cancer may be complicated by immunodeficiency. Greene et al[44] showed that skin cancer had occurred excessively after chronic lymphocytic leukemia. The risk of cancer seems elevated among patients with lymphoproliferative neoplasms that are associated with immunodeficiency.[45] Hoxtell and co-workers[46] reported that the risk of skin cancer in transplant recipients was seven times greater than expected.

Potential occupational risk factors of skin cancer include exposure to mineral oil, arsenic pesticides, coal tars, pitch, asphalt, soot, and paraffin waxes.[8] A recent survey of pesticide applicators revealed an excess mortality from skin cancer.[47] However, no investigation has been conducted to determine whether these agents are responsible for skin cancer in blacks. Inorganic arsenic is generally recognized as a cause of skin cancer in man.[48] In the Howard University study, no patient had a history of arsenic ingestion. A study in Taiwan showed that the prevalence of skin cancer in 160,000 inhabitants drinking well water, containing 0.8 to 2.5 ppm of arsenic, was 25 to 30 times that of western countries and seven times greater than that of the general population in Taiwan.[49] In the United States the general population is exposed to relatively large amounts of inorganic arsenic. An estimated 50 to 60 million pounds of arsenic trioxide alone are used annually.[50] The average person could easily ingest or inhale 100 g of arsenic in a lifetime.[51]

Cigarette smoke contains an average arsenic content of 6 ppm.[52] Smoking might be an attributable risk of skin cancer in blacks. However, in the Howard University cases, information on smoking was insufficient for evaluation.

SUMMARY

This study concludes that squamous cell carcinoma of the skin in blacks is more common than basal cell carcinoma, while in whites, basal cell carcinoma is more common than squamous cell carcinoma. Blacks in this series had a higher dis-

tribution of skin cancer on the lower extremities as compared with whites in other surveys. The reasons for this are unknown and remain to be studied in the future.

Review of the epidemiologic findings of possible exogenous and endogenous factors in the etiology of skin cancer provides a classic example of a multiple causal pattern. As there is a high frequency of squamous cell carcinoma of the skin in blacks, early detection and prevention should benefit the patient. Considering the difficulties encounted in applying epidemiologic methods to skin cancer on a national scale, etiologic studies should be conducted in carefully selected areas. Future investigations of skin cancer in blacks should include an examination of risk factors such as burns, trauma, and diet, and familial and immunologic aspects as well.

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